

CLAIMS

1. An electrical system, including:  
a load; and  
5 a supply connected to the load, wherein the supply includes:  
a source; and  
a regulator configured to:  
monitor the output of the source;  
coarsely adjust the output to the load if the output crosses a  
10 coarse-adjustment threshold; and  
finely adjust the output to the load if the output does not cross  
the coarse-adjustment threshold and crosses a fine-adjustment  
threshold.
2. An electrical system according to claim 1, wherein the regulator is  
15 configured to finely adjust the output to the load by dithering the output to the  
load.
3. An electrical system according to claim 1, wherein the regulator is  
configured to coarsely adjust the output to the load by increasing or decreasing  
a duty cycle of the output to the load.
- 20 4. An electrical system according to claim 1, wherein:  
the regulator is further configured to compare the output to the load to  
a second coarse-adjustment threshold and a second fine-adjustment threshold;  
terminate the output to the load for a period if the first coarse-  
adjustment threshold is crossed;  
25 dither the output to the load downward if the first fine-adjustment  
threshold is crossed;  
dither the output to the load upward if the second fine-adjustment  
threshold is crossed; and  
apply the output to the load for the duration of the period if the second  
30 coarse-adjustment threshold is crossed.
5. An electrical system according to claim 4, wherein the regulator is  
further configured to:

decrease a duty cycle of the output to the load if the first coarse-adjustment threshold is crossed; and

increase the duty cycle of the voltage applied to the load if the second coarse-adjustment threshold is crossed.

5        6. A supply, including:

a source; and

a regulator connected to the source and configured to:

monitor the output of the DC source to a load; and

10        coarsely adjust the output to the load if the output crosses a coarse-adjustment threshold;

finely adjust the output to the load if the output does not cross the coarse-adjustment threshold and crosses a fine adjustment threshold.

7.        A supply according to claim 6, wherein the regulator is configured to coarsely adjust the output to the load by:

15        applying or cutting the output to the load for the duration of a period; and

adjusting a duty cycle of the output to the load.

8.        A supply according to claim 6, wherein the regulator is configured to finely adjust the output to the load by dithering the output to the load.

20        9.        A supply according to claim 6, wherein the regulator is configured to coarsely adjust the output to the load by increasing or decreasing a duty cycle of the output to the load.

10.       A supply according to claim 6, wherein:

25        the regulator is further configured to compare the output to the load to a second coarse-adjustment threshold and a second fine-adjustment threshold;

terminate the output to the load for a period if the first coarse-adjustment threshold is crossed;

dither the output to the load downward if the first fine-adjustment threshold is crossed;

30        dither the output to the load upward if the second fine-adjustment threshold is crossed; and

apply the output to the load for the duration of the period if the second coarse-adjustment threshold is crossed.

11. A supply according to claim 10, wherein the regulator is further configured to:

decrease a duty cycle of the output to the load if the first coarse-adjustment threshold is crossed; and

5 increase the duty cycle of the voltage applied to the load if the second coarse-adjustment threshold is crossed.

12. A voltage regulator for regulating the voltage applied to a load, including:

a comparing circuit connected to the load and configured to:

10 measure the voltage applied to the load; and

compare the voltage applied to the load to a first threshold and a second threshold; and

a control circuit responsive to the comparing circuit and configured to:

15 coarsely adjust the voltage applied to the load if the first threshold is crossed; and

finely adjust the voltage applied to the load if the second threshold is crossed.

13. A voltage regulator according to claim 12, wherein the control circuit is configured to finely adjust the voltage applied to the load by dithering the  
20 voltage applied to the load.

14. A voltage regulator according to claim 12, wherein the control circuit is configured to coarsely adjust the voltage applied to the load by increasing or decreasing a duty cycle of the voltage applied to the load.

15. A voltage regulator according to claim 12, wherein:  
25 the comparing circuit is further configured to compare the voltage applied to the load to a third threshold and a fourth threshold; and  
the control circuit is configured to:

terminate the voltage applied to the load for a period if the first threshold is crossed;

30 dither the voltage applied to the load downward if the second threshold is crossed;

dither the voltage applied to the load upward if the third threshold is crossed; and

apply the voltage applied to the load for the duration of the period if the fourth threshold is crossed.

16. A voltage regulator according to claim 15, wherein the control circuit is further configured to:

5               decrease a duty cycle of the voltage applied to the load if the first threshold is crossed; and

              increase the duty cycle of the voltage applied to the load if the fourth threshold is crossed.

17. A method of controlling a supply voltage, including:

10               monitoring an output of the supply to a load;

              coarsely adjusting the output if the output crosses a first threshold;

              finely adjusting the output if the output does not cross the first threshold and crosses a second threshold.

18. A method of controlling a supply voltage according to claim 17, wherein finely adjusting the output includes dithering the output.

19. A method of controlling a supply voltage according to claim 17, wherein the coarsely adjusting the output includes increasing or decreasing a duty cycle of the output.

20. A method of controlling a supply voltage according to claim 17, further including:

              comparing the output to a third threshold and a fourth threshold;

              terminating the output for a period if the first threshold is crossed;

              dither the output downward if the second threshold is crossed and the first threshold is not crossed;

25               dither the output upward if the third threshold is crossed and the fourth threshold is not crossed; and

              apply the output for the duration of the period if the fourth threshold is crossed.

21. A method of controlling a supply voltage according to claim 20, further including:

              decreasing a duty cycle of the output if the first threshold is crossed;

and

increasing the duty cycle of the output if the fourth threshold is crossed.